

CLAIMS

We claim:

1 1. An antenna system, comprising:
2 at least one antenna radiating element; and
3 a first conductive ground plane spaced from said at least one antenna radiating
4 element, said first conductive ground plane comprising a conductive fluid.

1 2. The antenna system according to claim 1 further comprising a plurality of said
2 antenna radiating elements disposed on a substrate surface, at least one set of said
3 plurality of antenna radiating elements dimensioned for operating on a separate
4 frequency band as compared to a second set of said plurality of antenna radiating
5 elements.

1 3. The antenna system according to claim 2 further comprising a second conductive
2 ground plane, said first conductive ground plane disposed between said second
3 conductive ground plane and said radiating elements.

1 4. The antenna system according to claim 1 wherein said conductive fluid is
2 disposed within at least one cavity defined within a dielectric structure.

1 5. The antenna system according to claim 4 wherein said dielectric structure forms
2 a continuous sheet between said antenna radiating elements and said second
3 conductive ground plane.

1 6. The antenna system according to claim 4 wherein said conductive fluid is
2 disposed within a network of channels defined within said dielectric structure.

1 7. The antenna system according to claim 6 wherein said network of channels are
2 arranged in the form of a grid pattern.

1 8. The antenna system according to claim 6 wherein said network of channels are
2 arranged and spaced so to prevent the transmission through said network of channels
3 of RF at an operating frequency of said at least one antenna radiating element.

1 9. The antenna system according to claim 4 wherein said dielectric structure is
2 arranged in the form of a grid pattern.

1 10. The antenna system according to claim 1 wherein said conductive fluid is
2 selected from the group consisting of a metal or a metal alloy that is liquid at room
3 temperature, and a solvent electrolyte mixture.

1 11. The antenna system according to claim 1 further comprising at least one fluid
2 control system for selectively purging said conductive fluid from said first ground plane
3 responsive to a control signal.

1 12. The antenna system according to claim 11 wherein said control system is
2 comprised of at least one pump and one valve.

1 13. The antenna system according to claim 11 wherein said fluid control system
2 replaces said conductive fluid with a dielectric fluid responsive to a second control
3 signal.

1 14. A method for dynamically changing an effective distance between an antenna
2 radiating element and a ground plane, comprising the steps of:
3 positioning at least one antenna radiating element at a location spaced from a
4 dielectric structure;
5 responsive to a control signal, injecting a conductive fluid into at least one cavity
6 contained within said dielectric structure to form a first ground plane for said at least one
7 antenna radiating element.

1 15. The method according to claim 14 further comprising the step of purging said
2 conductive fluid responsive to a control signal to expose said at least one antenna
3 radiating element to a second conductive ground plane.

1 16. The method according to claim 14 further comprising the steps of positioning a
2 plurality of said antenna radiating elements on a substrate surface and dimensioning at
3 least one set of said plurality of antenna radiating elements for operating on a separate
4 frequency band as compared to a second set of said plurality of antenna radiating
5 elements.

1 17. The method according to claim 16 further comprising the step of positioning said
2 dielectric structure at a location disposed between said radiating elements and a second
3 conductive ground plane.

1 18. The method according to claim 14 further comprising the step of forming said
2 dielectric structure as a continuous sheet.

1 19. The method according to claim 14 further comprising the step of injecting said
2 conductive fluid into a network of channels defined within said dielectric structure.

1 20. The method according to claim 19 further comprising the step of arranging said
2 network of channels in the form of a grid pattern.

1 21. The method according to claim 19 further comprising the step of arranging said
2 network of channels with a spacing selected to prevent the transmission through said
3 network of channels of RF at an operating frequency of said at least one antenna
4 radiating element.

1 22. The method according to claim 14 further comprising the step of selecting said
2 conductive fluid from the group consisting of a metal or a metal alloy that is liquid at
3 room temperature, and a solvent electrolyte mixture.

- 1 23. The method according to claim 14 further comprising the step of replacing said
- 2 conductive fluid with a dielectric fluid responsive to a second control signal.